IN THE CLAIMS

1. (currently amended) Method for the reconstruction of holographic images, the holographic image being detected by an image detection device, the holographic image being transformed in a digitized hologram, the digitized hologram being made of ~~a number Vr of signal intensity values corresponding to as many elementary sib-images of "pixels"~~ a number Vr of elementary pixels of the holographic image sampling intervals, the method comprising a first step of processing the digitized hologram array, and a second step of hologram reconstruction in the ~~complex~~ image plane starting from the digitized hologram processed in the first step, the method being ~~characterised~~ characterized in that the second step is carried out through discrete Fresnel transform starting from an array of Ve values, comprising said Vr values and an integer number $p=Ve-Vr>$[D]] 0 of constant values equal to OS =0[[,]] ~~corresponding to as many pixels of sizes equal to the ones of the others~~.

2. (currently amended): Method according to claim 1, characterized in that said p ~~constant~~ values are ~~null b] values (OS=0)~~ 0.

3. (previously presented): Method according to claim 1, characterized in that said p values are arranged externally to said array of Vr values.

4. (original): Method according to claim 3, characterized in that said p values are arranged in a symmetrical way.

5. (original): Method according to claim 3, characterized in that said p values are arranged in a non-symmetrical way.

6. (currently amended): Method according to claim 1, characterized in that said number Ve of values is inversely proportional to the desired pixel size to be obtained for the reconstructed image.

7. (currently amended) Method according to claim 1, characterized in that the digitized hologram is a square array of $Vr=Nr.Mr$ values, where Nr and Mr each ~~value~~ correspond[[ing]] respectively to a square pixel of sizes Δx, Δy where Δx and Δy are respectively sampling spacings along the x-axis and the y-axis. .

8. (currently amended): Method according to claim 7, characterized in that the hologram reconstructed in the second step is represented by a square array of $Ve=Ne.Me$ values,

where $Ne = (\lambda d/\Delta x^2)$ and $Me = (\lambda d/\Delta y^2)$, each value corresponding to a square pixel of sizes $\Delta\xi = (\lambda d/Ne\Delta x)$ and $\Delta\eta = (\lambda d/Me\Delta y)$, λ being the wavelength of the wave beam striking the object of which the hologram is recorded, and d the distance between the detection device and the object of which the hologram is detected, $\Delta\xi$ and $\Delta\eta$ being the reconstructed holographic image sampling intervals.

9. (currently amended): Method according to claim 8, characterized in that $Nc = (\lambda d/\Delta x^2)$, $Me = (\lambda d/\Delta y^2)$, [[()]] $\Delta\xi = \Delta x$, $\Delta\eta = \Delta y$.

10. (previously presented): Method according to claim 1, characterized in that, after the second step, if each holographic image sampling interval is not equal or less than a certain threshold, the number of values p added to the digitized hologram array is increased and the second step is carried out again.

11. (previously presented): Method according to claim 10, characterized in that said threshold is a function of the signal-to-noise ratio of the holographic image.

12. (previously presented): Computer program characterized in that it comprises code means apt to execute, when running on a computer, the method according to claim 1.

13. (original): Memory medium, readable by a computer, storing a program, characterized in that the program is the computer program according to claim 12.

14. (previously presented): Apparatus for detection of holographic processing unit, characterized in that the processing unit processes the detected data by using the method according to claim 1.